

The Office of Environment, Safety and Health and its Office of Nuclear and Facility Safety (NFS) publishes the Operating Experience Weekly Summary to promote safety throughout the Department of Energy (DOE) complex by encouraging feedback of operating experience and encouraging the exchange of information among DOE nuclear facilities.

The Weekly Summary should be processed as an external source of lessons-learned information as described in DOE-STD-7501-96, *Development of DOE Lessons Learned Programs*.

To issue the Weekly Summary in a timely manner, the Office of Operating Experience Analysis and Feedback (OEAF) relies on preliminary information such as daily operations reports, notification reports, and, time permitting, conversations with cognizant facility or DOE field office staff. If you have additional pertinent information or identify inaccurate statements in the summary, please bring this to the attention of Dick Trevillian, 301-903-3074, or Internet address [dick.trevillian@hq.doe.gov](mailto:dick.trevillian@hq.doe.gov), so we may issue a correction.

Internet addresses provided in the Weekly Summary will be formatted as lower-case alphabetical characters. Numerical characters will be specifically defined when used in Internet addresses. The Internet Uniform Resource Locator (URL) for the Weekly Summary is [http://www.tis.eh.doe.gov/web/oeaf/oe\\_weekly/oe\\_weekly.html](http://www.tis.eh.doe.gov/web/oeaf/oe_weekly/oe_weekly.html). If you experience difficulties accessing the Weekly Summary at this URL, please contact Mark Mortensen at 208-525-3753 for assistance.

*Readers are cautioned that review of the Weekly Summary should not be a substitute for a thorough review of the interim and final occurrence reports.*

# Operating Experience Weekly Summary 97-02

*January 3 through January 9, 1997*

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## EVENTS

### 1. PRE-FILTER CHANGED-OUT WITHOUT THE CORRECT PERSONAL PROTECTIVE EQUIPMENT

On December 31, 1996, at the Hanford Fast Flux Test Facility, a radiological control technician and a craft worker changed a pre-filter on a maintenance and storage facility area ventilation system without wearing the personal protective equipment required by the radiation work permit. The permit stated they were to wear a single set of anti-contamination clothing and two pairs of gloves. Instead, they wore only a single pair of protective gloves with standard work clothes. The craft person attended a pre-job briefing earlier in the day, but the technician did not. When the job started, the technician reviewed the work package. However, he did not see the radiation work permit, and the craft person did not inform him of the protective clothing requirement. No contamination resulted from this event. Failure to require involved workers to attend pre-job briefings and failure to communicate requirements created the potential for personnel contamination. (ORPS Report RL--PHMC-FFTF-1996-0006)

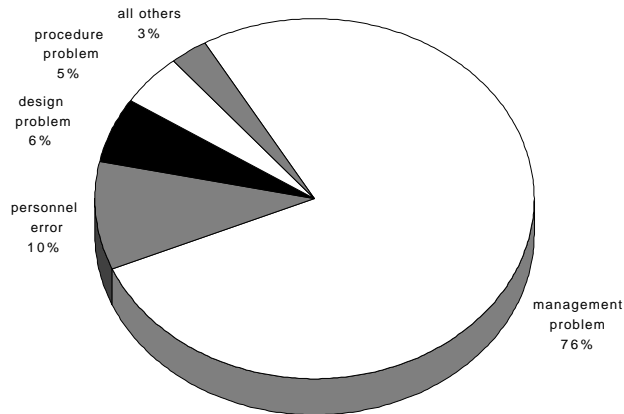
The facility manager convened a critique to investigate this event. Critique members determined that the radiation control technician discovered the radiation work permit while reviewing the facility radiation work permit status. He immediately notified his supervisor. Critique members found that, during the work package review, the radiation control technician suggested that personal protective equipment was unnecessary. When the technician reviewed the approved work package in the field and did not see the radiation work permit, he assumed his suggestion had been implemented. Critique members also believe that the craft worker should have informed the technician of the requirements before starting work. The facility manager is requiring all workers assigned to a job to attend the pre-job briefing. He is also considering ways to improve the pre-job briefing process.

NFS recently reported the following events where inadequate pre-job briefings and failure to communicate were causal factors.

- Weekly Summary 96-39 reported that on September 17, 1996, at the Hanford Plutonium Finishing Plant, two power operators caused a water hammer event when they opened a bypass valve instead of a diaphragm-operated valve as directed in the work package. Investigators determined that the potential for water hammer was not discussed during the pre-job briefing. (ORPS Report RL--WHC-PFP-1996-0038)
- Weekly Summary 96-39 also reported that on September 17, 1996, at Argonne National Laboratory—West, electricians preparing to conduct electrical maintenance on a 13.8-kV breaker opened the wrong breaker, and power to the Fuel Conditioning Facility and the Hot Fuel Examination Facility was lost. Investigators determined that the pre-job briefing was inadequate and that communication between the electricians was inadequate because it did not convey which breakers to open. (ORPS Report CH-AA-ANLW-ANLW-1996-0008)
- Weekly Summary 96-30 reported that on July 16, 1996, at the Rocky Flats Environmental Technological Site, supervisors for pipefitters working on a tank did not wear respiratory protection, even though the radiation work permit required all personnel to wear full-face respiratory protection. The

pipefitters wore respiratory protection. Radiological control technicians conducted a post-maintenance survey of the tank and found contamination of 25,000 dpm removable alpha contamination on a valve. All personnel at the job site immediately donned full-face respirators. During the critique, workers stated that, although they did not thoroughly review the radiation work permit before work began, the expected radiological control practices were discussed in detail during the pre-job briefing. Work-site personnel said they thought respiratory protection was required only for the pipefitters. This was contrary to the radiation work permit, which clearly required full-face respiratory protection for all personnel. (ORPS Report RFO--KHLL-771OPS-1996-0107)

Operating Experience Analysis and Feedback (OEAF) searched the Occurrence Reporting and Processing System (ORPS) database for work-planning deficiencies and found 187 occurrence reports DOE wide. Figure 1-1 shows the distribution of root causes for work planning issues.



**Figure 1-1. Distribution of Root Causes for Work Planning Issues<sup>1</sup>**

Management problems contributed to 76 percent of root causes for work planning deficiencies. A breakdown, showing the percentage of the causal codes is shown in Table 1-1.

**TABLE 1-1. CONTRIBUTION OF MANAGEMENT PROBLEMS BY CAUSAL CODES**

Work organization/Planning deficiency	78%
Inadequate administrative control	12%
Policy not adequately defined, disseminated, or enforced	7%
Inadequate supervision	2%
Improper resource allocation	1%

<sup>1</sup> OEAF engineers screened the ORPS data base for All Narrative "work planning deficiency@" for final reports for the period 01/01/96 through 01/01/97 and found 187 reports. Based on a random sample of 60 events, the accuracy of each slice is  $\pm 2.7$  percent.

These events underscore the importance of pre-job briefings and clear work control procedures for implementing maintenance work. Numerous sections in DOE 4330.4A, *Maintenance Management Program*, provide guidance on the elements necessary for effective maintenance programs at DOE facilities. DOE/EH-0256T, *Radiological Control Manual*, provides guidance on planning and performing radiological work. The radiological work permit is an administrative mechanism used to establish radiological controls for work activities. The responsibility for ensuring adequate planning and control of work activities resides with line management. The lead work group responsible for the planned activity or for the area should initiate preparation of the permit. Managers should ensure that work control processes are followed and radiological protection practices are enforced. DOE-STD-1050-93, *Guideline To Good Practices For Planning, Scheduling and Coordination of Maintenance at DOE Nuclear Facilities*, section 3.1.1.3, provides the key elements of an effective planning program. Included is guidance on consistency in planning between disciplines to avoid confusion and frustration of work groups. The standard also discusses the need for thorough reviews of work packages by experienced individuals to eliminate errors. Planning managers at DOE facilities should review their programs to ensure consistency with the standard.

**KEYWORDS:** communication, inattention-to-detail, pre-job briefing, work package

**FUNCTIONAL AREAS:** radiation protection

## **2. CRITICALITY SAFETY OFFICER FINDS VIOLATIONS DURING WALKDOWN**

On December 30, 1996, at the Rocky Flats Environmental Technology Site, a new building criticality safety officer identified four criticality safety infractions during an ongoing criticality safety walkdown. She found air filters stored in a glovebox that did not meet spacing requirements, part carriers that did not meet the spacing requirements, and two carts with expired building nuclear material safety limits. She also found no one had posted the most current limit requirements of the inter-plant manual for drum movement. She notified criticality safety engineers and requested written guidance. Operators posted the areas and carts as nuclear material safety-limit infractions. The shift manager terminated operations in the four affected areas. Violations of criticality safety administrative requirements may lower the margins of criticality safety. (ORPS Report RFO--KHLL-SOLIDWST-1996-0169)

Production in the building where the infractions occurred stopped in 1993. The building criticality safety officer is currently conducting a detailed walkdown of the entire building to identify and resolve all outstanding criticality safety issues. She will recommend long-term actions when she has completed the review. However, based on her observations to date, she plans to incorporate criticality safety training in weekly conduct of operations meetings for building personnel and to improve communications with criticality safety engineering by personally overseeing building operations.

NFS recently reported criticality safety issues at Rocky Flats in Weekly Summaries 96-49, 96-43, 96-37, 96-34, and 96-31. Weekly Summary 96-37 reported a criticality safety violation at Rocky Flats when workers moved drums into a storage area with previously infringed drums. Corrective actions included improving communications between operations staff and criticality safety engineers. (ORPS Report RFO--KHLL-771OPS-1996-0148)

Operating Experience Analysis and Feedback (OEAF) engineers reviewed the Occurrence Reporting and Processing System (ORPS) and found 188 criticality safety events DOE-

wide since January 1995 with a reported root cause; 131 (70 percent) of the events were from Rocky Flats. Historically, Rocky Flats has reported minor administrative errors that other sites would not report. Table 2-1 provides a list of the number of occurrences reported by root cause DOE-wide and at Rocky Flats, as well as the difference between the two.

**TABLE 2-1. CRITICALITY SAFETY EVENTS REPORTED BY ROOT CAUSE<sup>2</sup>**

<b>Cause</b>	<b>DOE-Wide</b>	<b>Rocky Flats</b>	<b>Difference</b>
Management problem	102	76	26
Personnel error	51	38	13
Procedure problem	12	5	7
Equipment problem	7	4	3
Design problem	7	3	4
Training deficiency	4	3	1
External phenomena	3	0	3
Radiological material problem	2	2	0

This event highlights the value of involving knowledgeable people who are not familiar with the facility in operations assessments. Commercial nuclear plant managers routinely request subject matter experts from other utilities assist them in conducting performance assessments. The plant managers report that these experts often identify issues their personnel overlooked. Although none of the findings identified in this inspection represented a significant criticality hazard, building personnel did not identify any shortcomings through the normal surveillance program. The surveillances required by Rocky Flats procedure NSP-10, *Monthly Criticality Safety Assessment*, did not identify the criticality safety problems. In the November 11, 1996, update to ORPS Report, "Description of Cause," a Rocky Flats facility manager described limitations associated with the scope of the performed surveillance because operators only check those conditions for which they have safety limit postings. (ORPS Report RFO--KHLL-SOLIDWST-1996-0059)

DOE 5660.1B, *Management of Nuclear Materials*, and DOE 5633.3B, *Control and Accountability of Nuclear Materials*, describe the nuclear materials management and safeguards systems required to account for nuclear materials. DOE-STD-1031-92, *Guide to Good Practices for Communications*, provides guidance to improve communications effectiveness.

**KEYWORDS:** storage, posting, inspection

**FUNCTIONAL AREAS:** nuclear/criticality safety, materials handling/storage

<sup>2</sup> OEAF engineers screened the ORPS database for Nature of Occurrence "01a" (nuclear criticality safety) for the Date of Discovery period 1/1/95 through 1/1/97 and found 202 events DOE-wide and 140 events for the Area/Field Office "RFO" (Rocky Flats). Only 188 events DOE-wide and 131 events at Rocky Flats reported root cause. Based on a random sample of 25 events, the accuracy of each data set is within  $\pm 1$  percent.

### 3. FAILURE TO FOLLOW PROCEDURES RESULTS IN CRITICALITY SAFETY CONCERNS

On December 31, 1996, at Hanford, the Plutonium Finishing Plant facility manager reported criticality safety violations because some material was not stored and handled in accordance with procedures. On that date, a solid waste operator discovered an isolated transport container, holding an undetermined amount of hood waste, located approximately 2 feet from a fixed array wagon containing 167 grams of plutonium. The criticality-prevention specification general limit requires a 3-foot minimum spacing between an undetermined amount of plutonium and quantities of plutonium greater than 100 grams. Operators roped off the area and posted it as a possible criticality infraction. While developing the recovery plan, a material handler discovered the fixed array wagon cylindrical positioning restraints were not closed and fastened as required by the criticality-prevention specification. Failure to meet spacing and handling requirements could have resulted in reduced criticality safety margins or a spill of radioactive materials. (ORPS Report RL--PHMC-PFP-1996-0015)

The facility manager led a critique and found that procedure violations led to this event. Critique members determined a material handling supervisor placed the fixed array wagon next to a non-isolating wall without checking for fissile material on the other side of the wall, as required by procedure. A non-isolating wall does not provide neutron shielding and is considered the same as open space for criticality safety purposes. Operating procedures direct that fissile material can not be located next to a non-isolating wall until the other side has been confirmed clear of material. Investigators found the material handling supervisor did not follow the procedure for moving radioactive materials. They also found material handlers prepared the fissile material movement form for the fixed array wagon 6 days before the move and did not re-verify the route. Also, the form directed moving the wagon to a different room than where it was found.

Operating Experience Analysis and Feedback engineers reviewed the Occurrence Reporting and Processing System and found 485 criticality safety events reported DOE-wide since 1990. The Richland Field Office has reported 48 of these criticality safety events; 23 were from the Plutonium Finishing Plant. The Plutonium Finishing Plant facility manager reported a similar event in August 1996, when material handlers found two isolated transport containers stored closer to other material than minimum spacing requirements allowed. Managers completed a corrective action program that included posting requirements placards at more suitable locations and training personnel about following directions on placards. Personnel will also receive semi-annual training on recent criticality safety events, including hands-on exercises. (ORPS Report RL--WHC-PFP-1996-0032)

This event underscores the need to follow material movement and storage procedures. Although the facility manager determined the root cause was inattention to detail, the event also indicates ineffective corrective actions from the August event. As discussed in the draft publication *DOE Highly Enriched Uranium Vulnerability Study Working Group Assessment Team Report, Oak Ridge Y-12, July 12, 1996* "these deficiencies [at the Y-12 facility on a similar issue] were believed to be caused by the cultural resistance to change rather than inadequate training." DOE 5480.24, *Nuclear Criticality Safety*, provides direction for establishing nuclear criticality safety program requirements. The Order invokes several American Nuclear Society standards relating to basic program elements and control parameters for nuclear criticality safety programs. DOE 5480.19, *Conduct Of Operations Requirements For DOE Facilities*, chapter II, "Shift Routines And Operating Practices," requires the operating crew to adhere to operating procedures and sound

operating practices. Chapter XVII of the Order, "Operator Aid Postings," discusses the use of posted information to aid operators in performing their duties.

The Working Group Assessment Team report is currently scheduled for release to the public on January 15, 1997. It should be available after that date by contacting the Info Center, (301) 903-0449, or by writing to ES&H Information Center, U.S. Department of Energy, EH-72/Suite 100, CXXI/3, Germantown, MD 20874.

**KEYWORDS:** solid waste, storage, procedure

**FUNCTIONAL AREAS:** nuclear/criticality safety, procedures, materials handling/storage

#### 4. **FRONT-END LOADER CUTS GUY WIRE CAUSING UNPLANNED POWER OUTAGE**

On December 31, 1996, at the Savannah River Solid Waste Management Facility, an operator inadvertently backed a front-end loader into a guy wire causing it to break. The cut guy wire contacted a 13.8-kV transformer short-circuiting it. The short circuit caused electrical protection fuses to blow and resulted in a power outage. A standby diesel generator started and provided backup power until utility electricians could return the transformer to service. The operator backed the front-end loader into the guy wire while installing crushed rock in the vicinity of the power pole. Failure to recognize hazards in the work area resulted in damage to the guy wire and the power outage. (ORPS Report SR--WSRC-SLDHSD-1996-0029)

Investigators determined that the work package for installing crushed rock did not address safe working distances from wires as specified in Westinghouse Safety Manual 8Q. The manual requires additional approvals when working within 3 feet of guy wires; however, work planners did not include this guidance in the work package. Investigators also learned that a spotter was not used during this activity.

NFS reported similar events in Weekly Summaries 96-49, 96-46, and 92-31. These events all involved the failure to use spotters and the lack of operator awareness of overhead lines and obstructions.

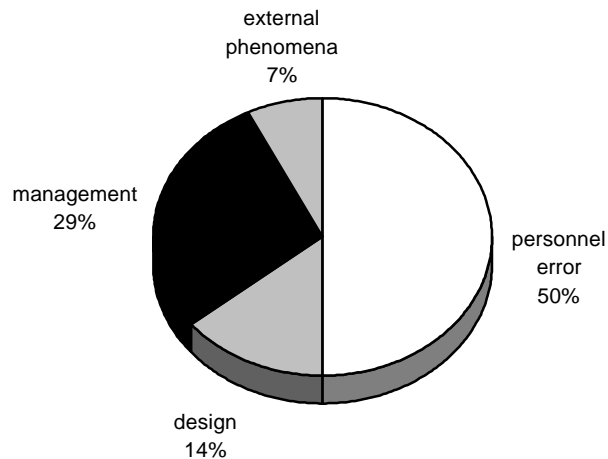
- On November 26, 1996, at Hanford, a dump truck moving forward with the tilt bed of the truck raised, contacted an overhead local area network cable. Investigators determined that spotters were not used. (Weekly Summary 96-49; ORPS Report RL--PHMC-TANKFARM-1996-0016)
- On November 22, 1996, at Argonne National Laboratory—East, a dump truck with the truck box raised snagged an overhead 120/240-volt power line and communication lines while leaving the dump site. Investigators determined that the Construction Job Specific Requirements form did not indicate an overhead line hazard and that spotters were not used. Corrective actions included modifying the form to include a review for overhead lines and designating a spotter. (Weekly Summary 96-49; ORPS Report CH-AA-ANLE-ANLEPFS-1996-0009)
- On November 6, 1996, at the Idaho National Engineering Laboratory Power Burst Facility, an operator backed a forklift into a 480-volt and 208-volt overhead power bundle with the raised forklift mast. Investigators determined that the forklift operator failed to use a spotter and failed to inspect the



overhead area around the work location. Corrective actions included installing concrete barriers to prevent vehicle access near the lines and requiring supervisors to walk down areas to identify potential hazards. (Weekly Summary 96-46; ORPS Report ID--LITC-PBF-1996-0001)

- On November 17, 1992, at Oak Ridge Y-12 Site, power was lost to a portion of the site when workers backed an equipment trailer into a power pole guy wire causing a short circuit and tripping a high-voltage circuit breaker. Investigators determined that the driver and a passenger did not adhere to training they had received a month earlier on proper techniques for backing trailers. A corrective action was to equip site guy wires with guy guards for improved visibility. (Weekly Summary 92-31; ORPS Report ORO--MMES-Y12SITE-1992-0008)

Operating Experience Analysis and Feedback (OEAF) engineers reviewed the Occurrence Reporting and Processing System (ORPS) database for events involving contact with guy wires and overhead lines and found 14 DOE-wide. Figure 4-1 shows the distribution of root causes reported by facility managers for these events.



**Figure 4-1. Distribution of Root Causes for Contacting Overhead Lines<sup>3</sup>**

Personnel errors accounted for 50 percent of the events, and management problems contributed to 29 percent. A breakdown, showing the percentage of these cause codes, is shown in Table 4-1.

<sup>3</sup> OEAF engineers screened the ORPS database for reports using the narrative search "guy wire OR overhead AND line@ OR cable@" and found 14 reports from 1990 to present. A 100% review of these reports verified their applicability.

**TABLE 4-1. ROOT CAUSES REPORTED FOR MANAGEMENT PROBLEMS AND PERSONNEL ERRORS****Management Problems**

Inadequate supervision	50%
Inadequate administrative control	25%
Other management problems	25%

**Personnel Error**

Inattention to detail	66%
Procedure problem	17%
Other human errors	17%

These events demonstrate the importance of exercising extreme caution when operating cranes, front-end loaders, forklifts, and other vehicles in the vicinity of guy wires, power lines, and switchyards. Pre-job briefings, facility procedures, and training programs should emphasize the dangers associated with these types of operations. Many events have occurred while personnel were backing up motive units, indicating that operators of equipment must be aware of hazards in all directions, including above them. DOE 4330.4B, *Maintenance Management Program*, section 8.3.1, provides guidelines on work control systems and procedures. The Order requires control procedures to help personnel understand the requirements for working safely. OSHA regulation 29 CFR 1926.550(a)(15)(iv), "Cranes and Derricks," states that a person shall be designated to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desired clearance by visual means. Section 1926.600(a)(6), "Equipment," states: "all equipment covered by this subpart shall comply with the requirements of 1926.550(a)(15) when working or being moved in the vicinity of power lines or energized transmitters." DOE facility managers should ensure that personnel understand the basics of work control practices, work planning, and safety and health hazard analysis.

**KEYWORDS:** work planning, inspection, power outage, transformer, wire

**FUNCTIONAL AREAS:** work planning, construction, industrial safety

## **5. GOOD PRACTICES FOR RADIATION STREAMING SURVEYS**

The Office of Nuclear Facility Safety recently received recommendations for good practices in radiation streaming surveys. DOE subject matter experts provided these recommendations based on two events reported in the OE Weekly Summary. Both events involved undetected radiation streaming that resulted in unposted high radiation areas. On November 26, 1996, at Hanford, a radiation technician conducting a routine weekly radiological survey discovered a high radiation area caused by streaming. The streaming came from a split shield plug in a hot-cell shield wall. (OE Weekly Summary 96-49 and ORPS Report RL--PHMC-GENERAL-1996-0005) On November 14, 1996, at the Pacific Northwest National Laboratory, a radiation technician conducting a weekly radiological survey

discovered a high radiation area caused by radiation streaming. The streaming came from three capped and locked source storage tubes in the Gamma Pit. (OE Weekly Summary 96-47 and ORPS Report RL--PNNL-PNNLBOPEM-1996-0005) In both events, radiation technicians initially failed to identify and post the locations as high radiation areas. Radiation personnel should also recognize the potential for new radiation streams caused by configuration changes that affect location, movement, or handling of high-activity sources. Failure to identify radiation streaming can result in areas where personnel may receive unanticipated exposures.

DOE subject matter experts offer the following good practices for conducting radiation surveys.

- Radiation technicians must understand the type of survey needed, and radiation supervisors or foreman need to clearly communicate the type of survey they want performed. A foreman may request a general area survey, but may not communicate that the radiation technician needs to specifically check for “streaming” or “hot spots.”
- Radiation technicians should understand when to use an ion chamber versus a GM detector for large area surveys as opposed to streaming surveys. When conducting radiation streaming surveys, GM instruments have distinct advantages over ion chambers. If an ion chamber is exposed to a highly collimated beam of radiation (i.e., streaming) and only that part of the chamber volume is irradiated, the instrument will under-respond in proportion to the chamber volume that is not exposed. In contrast, the GM detector is much more sensitive to collimated beams of radiation because the detector will pulse when a photon penetrates the detector from any direction.
- Radiation technicians should always use audible response when conducting surveys with a GM instrument. An audible count rate responds instantly to an increase in the dose rate; a meter response may not be fast enough to alert the technician to the presence of a narrow radiation beam. An audible response also allows the technician to observe the detector’s location instead of watching the meter display. Most ion chambers do not give an audible response because they measure electrical current versus electrical pulses.
- When practical, radiation technicians should use an extendable probe-type instrument, such as a teletector, to find intense localized beams of radiation in order to reduce personnel exposure. Using an extendable probe allows technicians to survey areas that are normally out of reach. When using a teletector, the detector should be moved in all directions and through all planes. Radiation technicians should carry a hand-held ion chamber when they use an extendable GM probe. An extended probe will only indicate the dose rate at the probe location (10 to 15 feet away). It will not read the dose rate at the technician’s location. Technicians should then use an ion chamber to quantify the beam once the streaming is located with the GM instrument. Technicians should be aware of ion chamber under-response problems when quantifying the radiation stream. In extreme radiation fields a GM tube will saturate, whereas an ion chamber will not.
- Radiation technicians need to remember to turn the secondary instrument on. Events have occurred because the radiation technician had the proper

instrument to perform a survey but forgot to turn it on. Technicians should also perform the required battery checks, review the calibration dates, and perform a visual inspection of their instruments.

- Radiation technicians should always carry proper dosimetry and should consider carrying an alarming dosimeter. This allows the technician to be alerted to radiation fields or streaming that may have been missed during the survey. Radiation technicians should be aware of the limitations of an alarming dosimeter and should not rely on this instrument to alert them in all types of radiation fields.

DOE/EH-0256T, *Radiological Control Manual*, states that personnel radiation exposure shall be maintained as low as reasonably achievable. The manual also states that each person involved in radiological work is expected to demonstrate responsibility and accountability through an informed, disciplined, and cautious attitude toward radiation and radioactivity. Article 314.4 and 552.3 discuss shield survey requirements. NFS issued DOE/NS-0007, Safety Notice 92-02, "Radiation Streaming at Hot Cells," in August 1992. The notice provides good practices regarding operation of hot cell facilities and the detection of streaming. DOE managers and facility managers should ensure that personnel understand their responsibility and accountability toward radiation and radioactivity.

**KEYWORDS:** hot spots, radiation surveys, streaming

**FUNCTIONAL AREAS:** radiation protection

## ***PRICE-ANDERSON AMENDMENTS ACT (PAAA) INFORMATION***

### **1. PRELIMINARY NOTICE OF VIOLATION FOR MODIFICATIONS AFFECTING FACILITY OPERATIONS**

On December 18, 1996, the DOE Office of Enforcement and Investigation issued a Preliminary Notice of Violation under the Price-Anderson Amendments Act to the Los Alamos National Laboratory. The notice addressed the unauthorized modification of tritium monitors at the Tritium Science and Fabrication Facility. A second issue concerning a modification to install a building sump was also addressed in the notice letter. The Office of Enforcement and Investigation conducted an on-site review of these issues on July 16-17, 1996, and concluded that violations of the DOE's Quality Assurance Rule (10 CFR 830.120) probably occurred. The potential violations represent weaknesses in design control, work control, and quality improvement. [NTS Report NTS-ALO-LA-LANL-TSF-1996-0001; letter, DOE (T. O'Toole) to Los Alamos National Laboratory (S. Hecker), 12/18/96]

The Preliminary Notice of Violation concerned the unauthorized modification of three tritium monitors identified by a DOE facility representative in March 1996. A radiological control technician modified the monitors using a blueberry can from a muffin mix as a filter housing, a styrofoam cup as a gasket, and a respirator cartridge as an air filter. These modifications could have affected operability of the monitors. The technician made the modification without a formal design review or approval, procedures to control installation of the modification, or calibration testing to demonstrate accurate operability of the modified monitors. Although the facility representative alerted the technician of the need for formal design reviews, none were performed. The facility operating safety requirement states that these monitors shall be operable during tritium operations. The

monitors are also listed as a safety feature in the facility safety assessment and basis for interim operation.

A second issue reviewed by the Office of Enforcement and Investigation concerned an event that occurred on January 17, 1996, involving a modification to install a sump in a building basement (ORPS Report ALO-LA-LANL-TSF-1996-0001; Weekly Summaries 96-32, 96-05 and 96-04). During the modification, personnel accidentally cut a power line, resulting in a loss of power to certain safety features for the Tritium Science and Fabrication Facility. A Notice of Violation was not issued because, at the time of this incident, there was relatively limited experience across DOE with the application of the Quality Assurance Rule. However, the Office of Enforcement and Investigation concluded that because no one reviewed the sump modification to determine whether there was a potential impact on facility safety, it was not in compliance with the Laboratory's Quality Management Plan. (The plan implements 10 CFR 830.120.) The Laboratory's practice was to apply the quality management plan only to activities within the physical boundaries of the nuclear facility. However, the basement of the building, which houses the nuclear facility, contained electrical cabling and controls associated with ventilation systems for the Tritium Science and Fabrication Facility.

Los Alamos management proposed the following corrective actions as a result of these two issues.

- Clarify roles of different organizations at Los Alamos for maintenance, operational checks, establishment of requirements, and determination of quality management plan applicability.
- Counsel the radiation control technician, who modified the monitors, on the need to follow the quality management plan and applicable procedures.
- Brief team leaders and managers on problems with working on nuclear facility instruments, the need for formal design reviews, and impacts of Price-Anderson Amendments Act.
- Brief design/project leaders on the need to follow nuclear facility protocols.
- Coordinate all nuclear facility activities with the facility manager.
- Develop a master equipment list to aid the review of potential impact of planned work on nuclear safety and clarify rooms included within a nuclear facility.
- Incorporate lessons-learned into procedures for finding and reporting non-compliances.
- Continue Price-Anderson Amendments Act awareness training.

Los Alamos National Laboratory has 30 days to reply to this Preliminary Notice of Violation and admit or deny the alleged violations. The Preliminary Notice of Violation will become final if the laboratory does not deny the allegations and provide sufficient justification within the 30 day period.

The Price-Anderson Amendments Act subjects DOE contractors to civil penalties for violations of DOE rules, regulations, and compliance orders relating to nuclear safety requirements. The Office of Enforcement and Investigation may reduce a base civil

penalty by up to 100 percent when a DOE contractor promptly identifies a violation, reports it to DOE, and undertakes timely corrective action. Additionally, the enforcement policy allows DOE discretion to not issue a notice of violation in certain cases. The Non-compliance Tracking System (Weekly Summaries 95-17, 95-20) provides a means for contractors to promptly report potential non-compliances and take advantage of these mitigation provisions in the enforcement policy.

**KEYWORDS:** modification, tritium monitor, enforcement, Price-Anderson Act

**FUNCTIONAL AREAS:** modifications, licensing/compliance

## ***NOTICES UNDER DEVELOPMENT***

*The Office of Nuclear and Facility Safety encourages input related to the development of Notices. If you have any questions, comments, or information concerning events or issues similar to the following, please contact Mr. Dick Trevillian, Office of Nuclear and Facility Safety at (301) 903-3074 or at Internet address [dick.trevillian@hq.doe.gov](mailto:dick.trevillian@hq.doe.gov).*

OEAF is currently developing Safety Notices on the following issues:

1. Water Hammer